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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/088,412	03/20/2002	Herbert Markl	02481.1781	5276

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EXAMINER

NAFF, DAVID M

ART UNIT PAPER NUMBER

1651

DATE MAILED: 04/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/088,412

Applicant(s)

MARKL ET AL

Examiner

David M. Naff

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 39-50, 52-70, 81, 82 and 84-92 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 39-50, 52-70, 81, 82 and 84-92 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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**DETAILED ACTION**

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for  
5 continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/30/06 has been entered.

An amendment filed 1/30/06 amended claims 39, 45, 70, 81, 82 and  
10 90, and canceled claims 71-80.

Claims examined on the merits are 39-50, 52-70, 81, 82 and 84-92, which are all claims in the application.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

15 ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

20 The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 70 is rejected under 35 U.S.C. 112, first paragraph, as  
25 failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in

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the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Support is not readily apparent in the specification for the membrane having internal spaces and a gas outlet in an internal space as required by the claims. Page 15, lines 16-17, does not disclose such a membrane as asserted in the amendment.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

10       The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

15       Claims 45 and 70 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

20       Claim 45 is unclear as amended by requiring supplying the dialysis fluid space or the culture fluid space with the second gas since in claim 39, the second gas is introduced in the culture fluid space in the module. Therefore, the second gas cannot be introduced only in the dialysis fluid space as encompassed by the alternative now required by claim 45.

25       Amending claim 70 to require a dialysis membrane "having internal spaces", and a gas outlet in one of the internal spaces is uncertain as to the structure of a membrane with internal spaces, and an

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internal space containing an outlet. Membranes are normally thin, and it is not seen how the membrane can contain internal spaces, and an internal space large enough to contain a gas outlet.

***Claim Rejections - 35 USC § 103***

5        Claims 39-50, 52-70, 81, 82 and 84-92 are rejected under 35 U.S.C. 103(a) as being unpatentable over Portner et al (listed on form PTO-1449).

10        The claims are drawn to a method for culturing cells using a reaction system and to a reaction system for carrying out the method wherein the reaction system contains a container for dialysis fluid and a culture vessel for culturing cells and a membrane module in fluid communication with the container and vessel. The module contains two spaces separated by a dialysis membrane. Dialysis fluid is circulated through one of the two spaces and culture fluid is  
15        circulated through the other space. A first gas is introduced into the vessel for culturing cells, and a second gas is introduced into culture fluid space in the membrane module. Also claimed is the membrane module along with a gas supply means to supply gas to one of the spaces.

20        Portner et al disclose (Figure 2a, page 405) a reaction system as required by the present claims except for supplying gas to culture fluid in the dialysis module (membrane module). Portner et al disclose (page 404, right col, 3<sup>rd</sup> complete paragraph) that when cells are pumped through the external module, the cells can suffer from  
25        oxygen limitation. Figure 3a (page 406) discloses a reactor without

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an external module where a culture chamber is separated from a dialyzing chamber by a dialysis membrane. Air is supplied to the culture chamber. In Figure 3b, air is supplied to the dialyzing chamber.

5        It would have been obvious to supply air to space containing circulating culture liquid containing cells in the dialysis module of the reactor of Figure 2a of Portner et al to prevent cells from suffering oxygen limitation as disclosed on page 404 since it would have been apparent from Figure 3a that oxygen can be supplied to cells  
10    in a chamber separated from a dialyzing chamber by a dialysis membrane. The conditions of dependent claims not disclosed by Portner et al are conditions that would be expected to require control when using the reaction system of Portner et al, and such conditions would have been matters of optimization depending on individual preference  
15    well within the skill of the art. Providing air to the dialyzing chamber as required by certain claims would have been suggested by Figure 3b of Portner et al.

#### ***Response to Arguments***

The arguments are unpersuasive. While Portner et al may disclose  
20    that single-vessel dialysis reactors were proposed as an alternative to the two-vessel arrangement, this does make unobvious supplying air to cells in the dialysis module in Fig 2a of Portner et al as suggested by Portner et al disclosing supplying air to cells in culture fluid in contact with a dialysis membrane in Fig 3a. There is  
25    seen nothing to lead one to believe air cannot be supplied to cells in

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culture fluid in the dialysis module of Fig 2a analogous to supplying air to cells in culture fluid in contact with a dialysis membrane in Fig 3a. Portner et al disclose the problem that suspended cells can suffer from oxygen limitation when pumped through the external module.

5 Supplying oxygen to cells in the module would have been clearly an obvious way of overcoming the oxygen limitation problem since Fig 3a shows supplying oxygen to cells on one side of a dialysis membrane. The rejection is not based on supplying oxygen to the culture chamber of Fig 3b of Portner et al, but on supplying air to cells in the

10 module of Fig 2a. Because the single-vessel reactor of Figs 3a and 3b may have certain advantages over the two-vessel reactor of Fig 2a does not make unobvious supplying air to the module of the two-vessel reactor for the expected function of the air to supply oxygen to cells in the module. The problems of the two-vessel reactor exposing the

15 cells to stress due to pumping and requiring sophisticated control to balance liquid levels as disclosed by Portner et al will also be problems when using a two-vessel reactor as encompassed by the present claims. The claims require nothing that will overcome these problems. The claims address only the problem disclosed by Portner et al of

20 cells suffering oxygen limitation in the module. This problem is addressed in the claims in the way suggested by Portner et al, i.e. by supplying air to the cells in the module.

### **Conclusion**

Any inquiry concerning this communication or earlier

25 communications from the examiner should be directed to David M. Naff

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whose telephone number is 571-272-0920. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Wityshyn can be reached on 571-272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David M. Naff  
Primary Examiner  
Art Unit 1651

DMN  
4/10/06